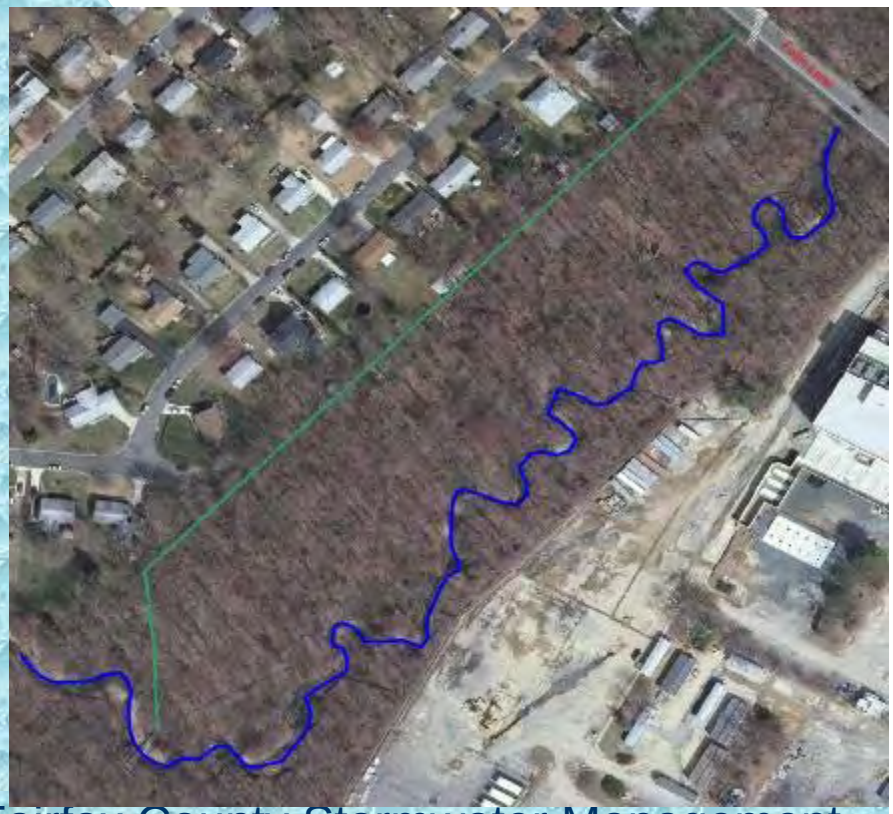
Wolftrap Creek
Stream Restoration



- Project Overview
- Background
- Objectives
- Existing Conditions
- Plan Review
- Examples
- Next Steps

Overview – Program Drivers

The Clean Water Act of 1972 …

"fishable and swimmable waters of the United States"

- **Chesapeake Bay Agreement**
- **Executive Order**
- **State and Federal Standards**
  - Municipal Separate Storm Sewer Permit (MS-4)
    - Easements rights and responsibility to maintain/upgrade
  - Forthcoming Requirements
    - Total Maximum Daily Loads (TMDL)
    - Regulates amounts of pollutants in waterways

Project Objectives

Restore ~ 2500 LF from Follin Lane to downstream end of Wildwood Park

- Maximize ecological potential
- Stabilize streambed and banks
- Minimize loss of trees
- Maintain close coordination with stakeholders
  - Continuity of trail use

Social Goals

- Recreation
- Community enhancement
- Educational opportunities
- Community involvement
- Open lines of communication
- Integrate concerns and desires of the community into the project design
- Example for rest of community

Project Objectives

Stream Restoration

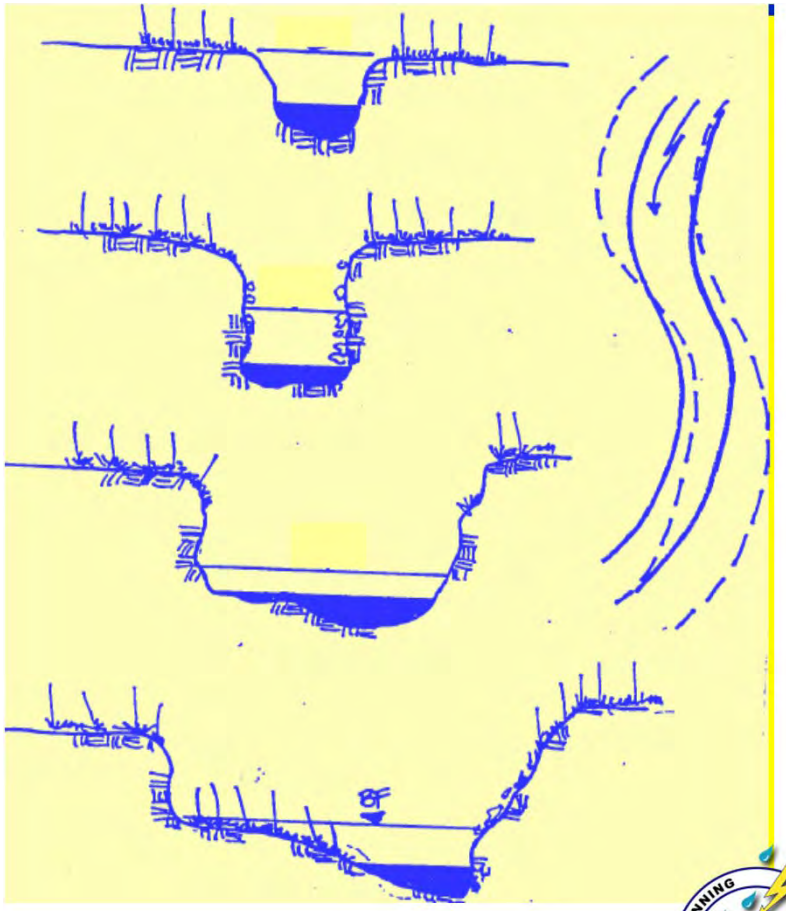
- More like “rehabilitation”. Restoring multiple environmental values and as much environmental health and integrity as possible.
- Return structure, functions, and dynamics to the maximum extent possible given the constraints of our modern, developed landscape.

Existing Conditions

- Most Fairfax County streams are responding to anthropogenic alteration of the landscape.
- Eight variables which shape and maintain stream channels:
  - discharge
  - width
  - depth
  - velocity
  - slope
  - channel roughness
  - bedload size
  - bedload volume

Indicators of a degraded stream channel;

- Downed trees
- Channel incision and widening
- Channel Scour
- Sediment aggradations
- Poor instream habitat
- Low plant species diversity



Existing Conditions

EXISTING CONDITION - LOOKING UPSTREAM AT ERODING MEANDER.

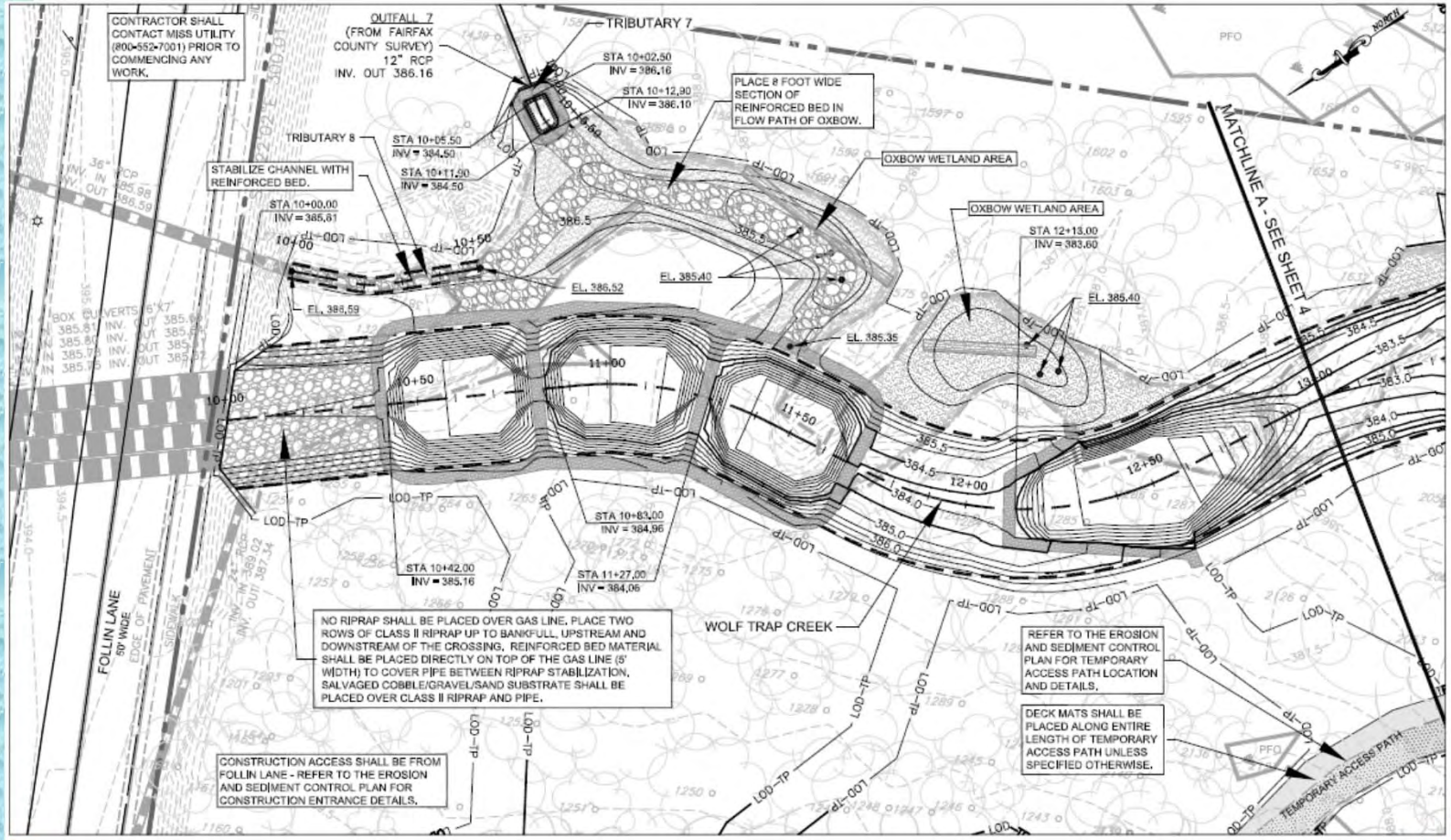
Existing Conditions

EXISTING CONDITION - STREAM CHANNEL ENCROACHING ON EXISTING PAVED TRAIL.

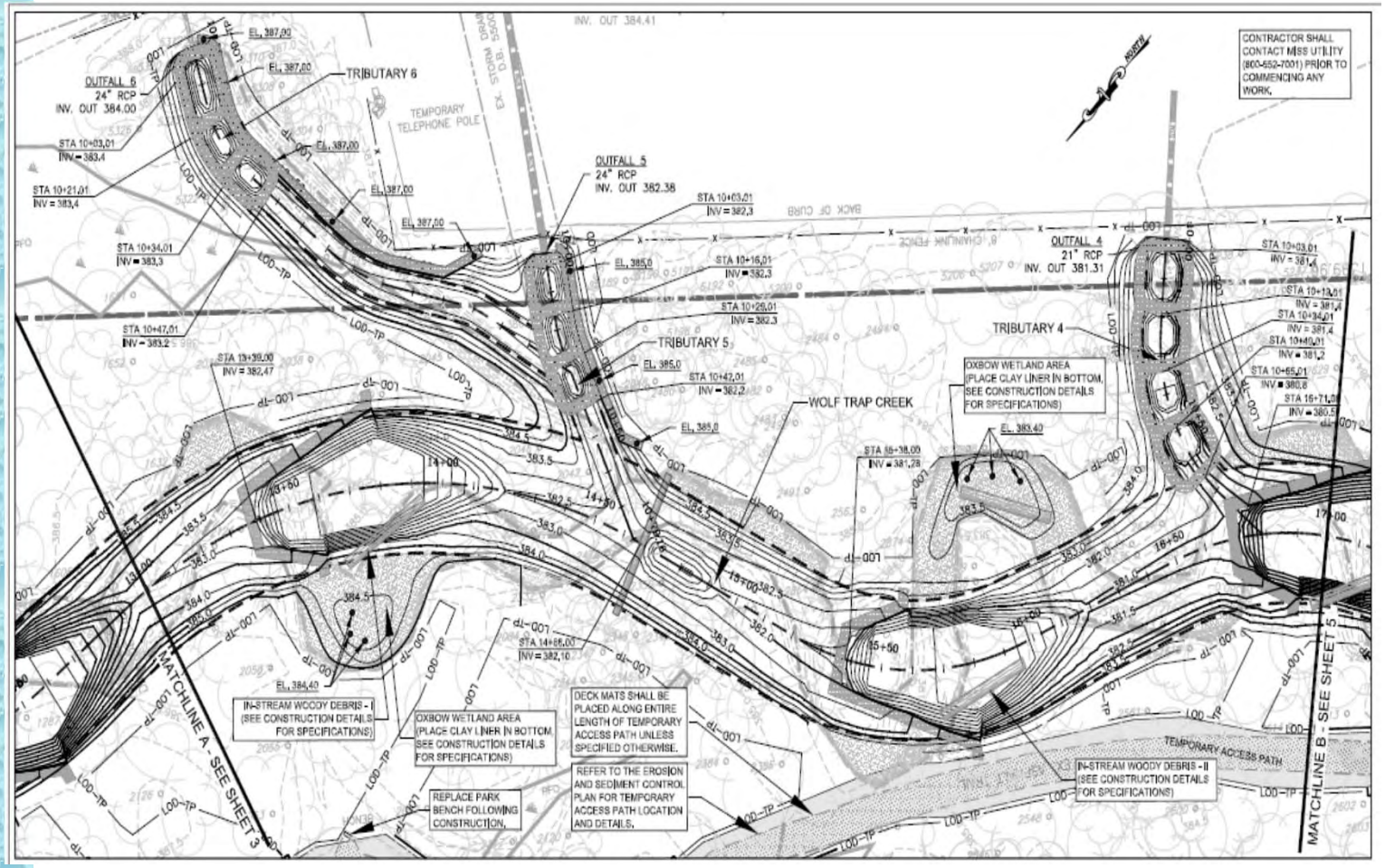
Existing Conditions

EXISTING CONDITION – LOOKING UPSTREAM AT THE CONFLUENCE OF TRIBUTARY 1 AND WOLF TRAP CREEK.

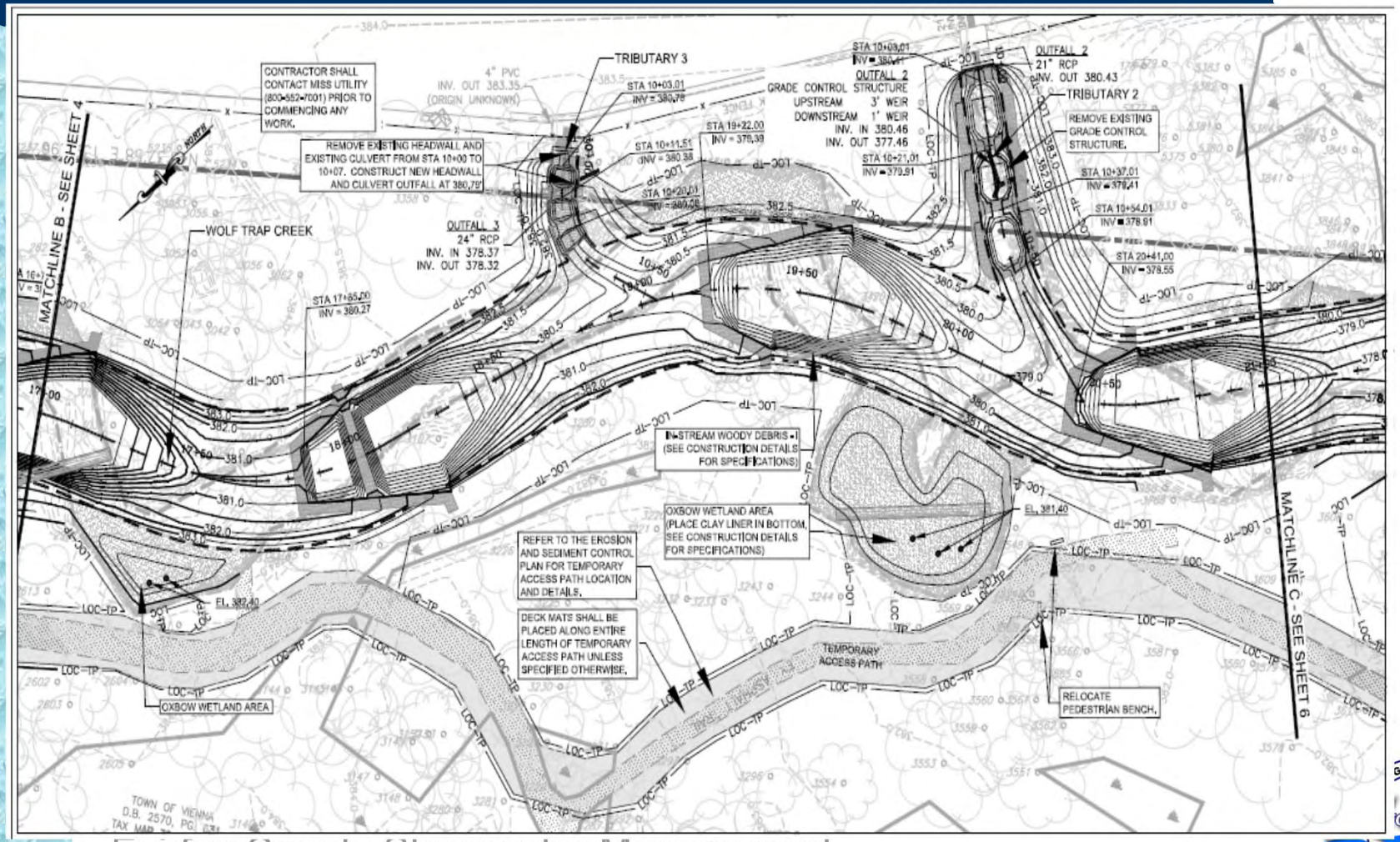
Proposed Design



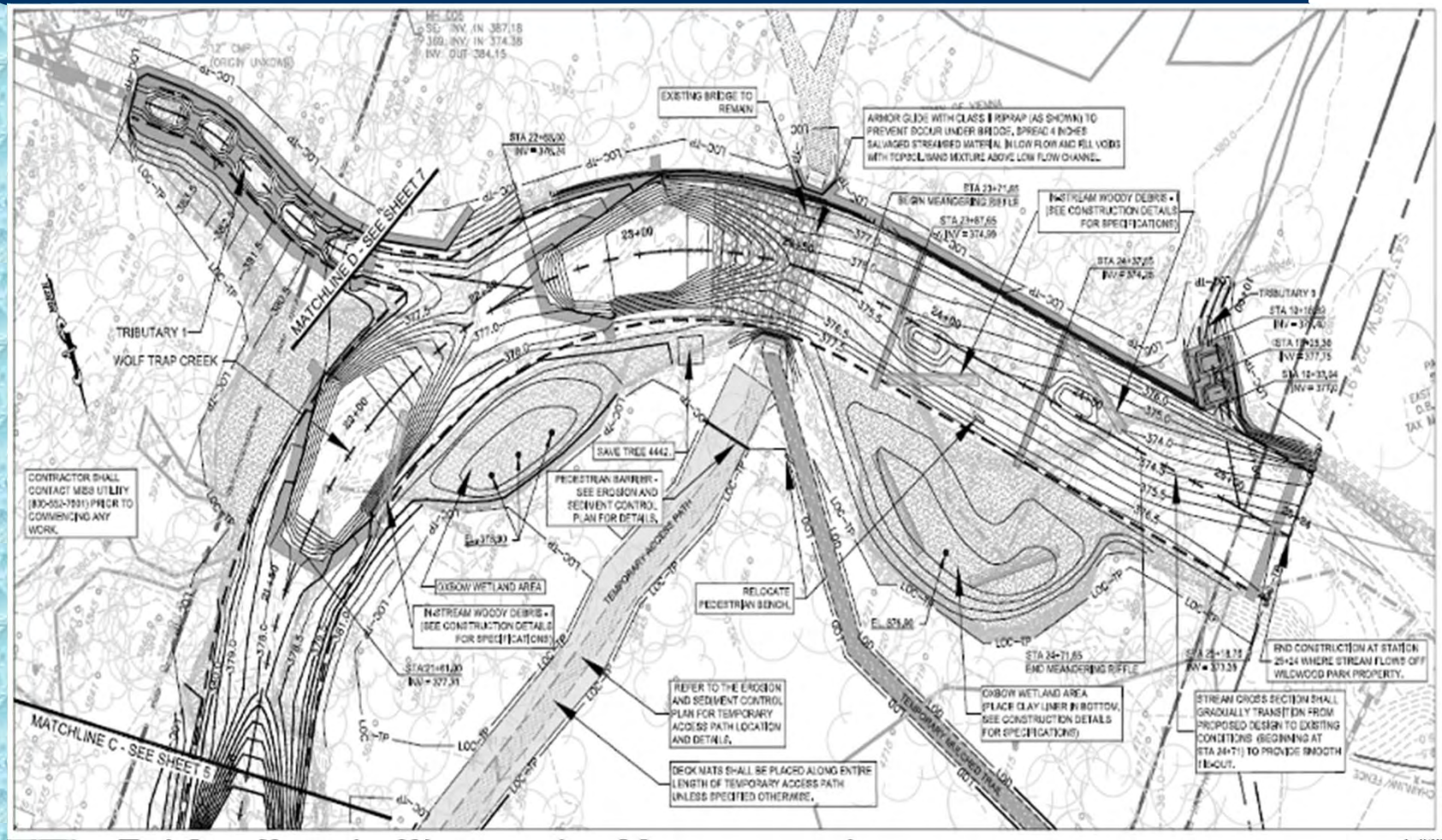
Proposed Design

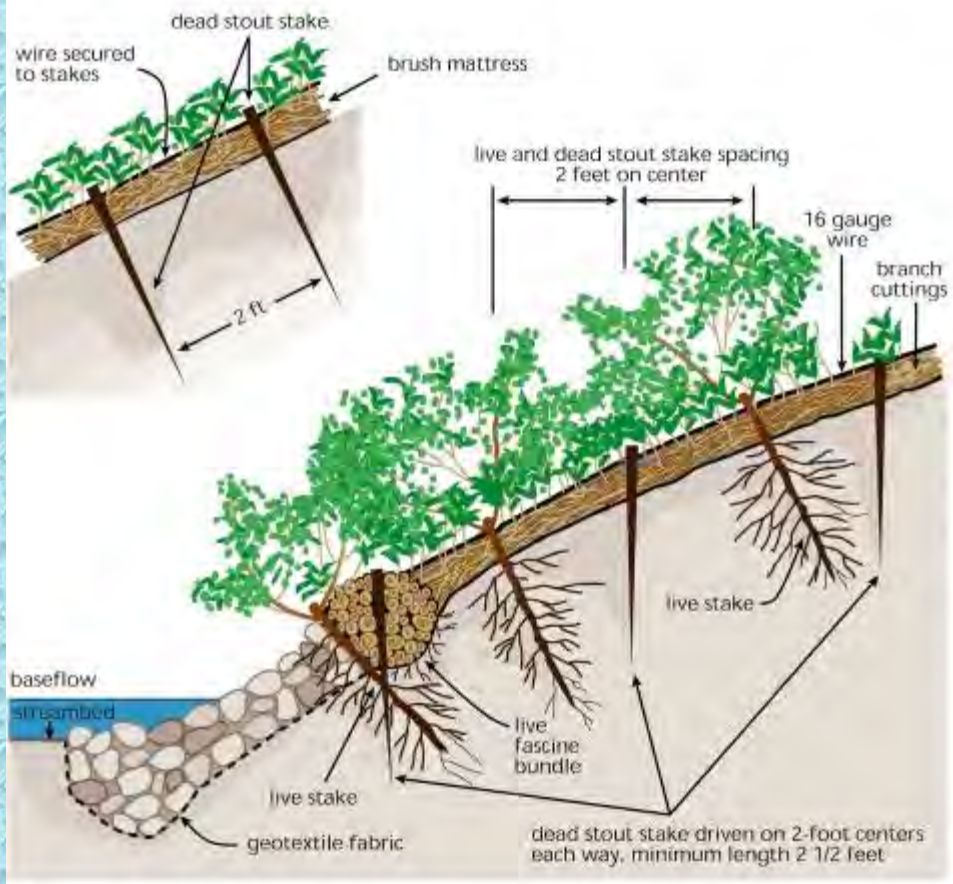


Proposed Design



Proposed Design





Note:
Rooted/leafed condition of the living plant material is not representative at the time of installation.
Source: Chapter 16 Engineering Handbook, USDA-NRCS, 1997.

Fig. 8.40 – Cutting systems. Details of brushmattressing techniques.
In Stream Corridor Restoration: Principles, Processes, and Practices, 10/98.
Interagency Stream Restoration Working Group (FISRWG)(15 Federal agencies of the US).

Fig. 8.46

Fig. 8.37b – A stabilized streambank, after establishment of remedial measures.
In Stream Corridor Restoration: Principles, Processes, and Practices, 10/98.
Interagency Stream Restoration Working Group (FISRWG)(15 Federal agencies of the US).

In-stream Structures: Rock Cross Vane

In-stream Structures: Step Pools

Structures: Riffle

Example Projects

Example Projects

Example Projects

Example Projects

Construction



PLANTING SCHEDULE

CONTAINER PLANTING ZONE		SPECIES GROUP[1,2]	SPECIES[2]	INDICATOR STATUS	PLANT SPACING[3]	CONTAINER SIZE, RATE, AND QUANTITY[4]	
						PLANTS PER ACRE	# OF PLANTS
RIPARIAN FOREST	TREE LAYER	1	QUERCUS ALBA (WHITE OAK)	FACU-	SEE NOTE #3	300 ONE-GALLON –or– 600 TUBELINGS –or– MIX AT 1:2 RATIO (SEE NOTE #4)	405 (BASED ON ONE-GALLON)
			QUERCUS BICOLOR (SWAMP WHITE OAK)	FACW+			
			QUERCUS PALUSTRIS (PIN OAK)	FACW			
			QUERCUS PHELLOS (WILLOW OAK)	FAC+			
			QUERCUS RUBRA (NORTHERN RED OAK)	FACU-			
		2	ACER NEGUNDO (BOX ELDER)	FAC+	SEE NOTE #3	150 ONE-GALLON –or– 300 TUBELINGS –or– MIX AT 1:2 RATIO (SEE NOTE #4)	204 (BASED ON ONE-GALLON)
			ACER RUBRUM (RED MAPLE)	FAC			
			BETULA NIGRA (RIVER BIRCH)	FACW			
			LIQUIDAMBAR STYRACIFULA (SWEET GUM)	FAC			
			NYSSA SYLVATICA (BLACK GUM)	FACW+			
			PLATANUS OCCIDENTALIS (AMERICAN SYCAMORE)	FACW-			
		3	ILEX OPACA (AMERICAN HOLLY)	FACU+	SEE NOTE #3	100 ONE-GALLON –or– 200 TUBELINGS –or– MIX AT 1:2 RATIO (SEE NOTE #4)	135 (BASED ON ONE-GALLON)
	SHRUB LAYER	4	AMELANCHIER CANADENSIS (CANADIAN SERVICEBERRY)	FAC	SEE NOTE #3	150 ONE-GALLON –or– 300 TUBELINGS –or– MIX AT 1:2 RATIO (SEE NOTE #4)	204 (BASED ON ONE-GALLON)
			CERCIS CANADENSIS (EASTERN REDBUD)	FACU-			
			CORNUS FLORIDA (FLOWERING DOGWOOD)	FACU-			
			CORYLUS AMERICANA (AMERICAN HAZELNUT)	FACU-			
			LINDERA BENZOIN (NORTHERN SPICEBUSH)	FACW-			
			VIBURNUM DENTATUM (SOUTHERN ARROWWOOD)	FAC			
			VIBURNUM PRUNIFOLIUM (BLACK-HAW)	FACU			
RIPARIAN FOREST QUANTITY SUBTOTALS						**700**	**948**
STREAM BANK	TREE AND SHRUB LAYER	5	CORNUS AMOMUM (SILKY DOGWOOD)	FACW	SEE NOTE #3 (AVERAGES 3' O.C. FOR ONE-GALLON)	N/A	1,080 (BASED ON ONE-GALLON)
			ILEX VERTICILLATA (COMMON WINTERBERRY)	FACW+			
			SAMBUCUS CANADENSIS (ELDERBERRY)	FACW-			
			VIBURNUM DENTATUM (SOUTHERN ARROWWOOD)	FAC			
	TREE LAYER	6	PLATANUS OCCIDENTALIS (AMERICAN SYCAMORE)	FACW-	SEE NOTE #3 (AVERAGES 6' O.C. FOR ONE-GALLON)	N/A	540 (BASED ON ONE-GALLON)
			BETULA NIGRA (RIVER BIRCH)	FACW			
STREAM BANK QUANTITY SUBTOTALS						---	**1,620**
STREAM EDGE	TREE AND SHRUB LAYER	7	ALNUS SERRULATA (BROOKSIDE ALDER)	OBL	1' O.C. (SEE NOTES #5, #6)	N/A	3,242 (TUBELINGS OR LIVESTAKES ONLY – SEE NOTE #5)
			CORNUS AMOMUM (SILKY DOGWOOD)	FACW			
			SALIX NIGRA (BLACK WILLOW)	FACW+			
			VIBURNUM DENTATUM (SOUTHERN ARROWWOOD)	FAC			
STREAM EDGE QUANTITY SUBTOTALS						---	**3,242**





SEEDING SCHEDULE

SEED PLANTING ZONE	SPECIES GROUP[1,2]	SPECIES[2]	INDICATOR STATUS	SEEDING RATE[3] (LBS/AC)	AREA PER PLANT (AC)	QUANTITY (LBS)
RIPARIAN BUFFER SEED MIX	8	LOLIUM MULTIFLORUM (ANNUAL RYEGRASS)	NI	45.00	0.33	76.50
		SETARIA ITALICA (FOXTAIL MILLET) (OR ECHINOCHLOA CRUSGALII VAR. FRUMENTACEA)	UPL	45.00	0.33	76.50
	9	CAREX SQUARROSA (SQUARROSE SEDGE)	NI	0.25	0.33	0.44
		CAREX VULPINOIDEA (FOX SEDGE)	OBL	0.25	0.33	0.44
		JUNCUS EFFUSUS (SOFT RUSH)	FACW+	0.25	0.33	0.44
	10	ELYMUS VIRGINICUS (VIRGINIA WILD RYE)	FACW-	0.25	0.33	0.44
		PANICUM CLANDESTINUM (DEER TONGUE GRASS)	FAC+	0.25	0.33	0.44
		PANICUM DICHOTOMIFLORUM (SMOOTH PANIC GRASS)	FACW-	0.25	0.33	0.44
	11	ANEMONE VIRGINIANA (THIMBLEWEED)	NI	0.20	0.33	0.35
		ASTER PRENANTHOIDES (ZIG ZAG ASTER)	FAC	0.20	0.33	0.35
	12	ASCLEPIAS SYRIACA (COMMON MILKWEED)	UPL	0.20	0.33	0.35
		BIDENS FRONDOSA (BEGGAR TICKS)	FACW	0.20	0.33	0.35
		ONOCLEA SENSIBILIS (SENSITIVE FERN)	FACW	0.20	0.33	0.35
	13	POLYGONUM PENSYLVANICUM (PA SMARTWEED)	FACW	0.20	0.33	0.35
	14	ARONIA MELANOCARPA (BLACK CHOKEBERRY)	UPL	0.10	0.33	0.16
		ILEX VERTICILLATA (WINTERBERRY)	FACW+	0.10	0.33	0.16
		VIBURNUM DENTATUM (SOUTHERN ARROW WOOD)	FAC	0.10	0.33	0.16
	15	CARPINUS CAROLINIANA (MUSCLEWOOD)	FAC	0.10	0.33	0.16
		PLATANUS OCCIDENTALIS (AMERICAN SYCAMORE)	FAC	0.10	0.33	0.16
SEEDING TOTALS				93.20		158.54






Completed Projects

Example: Poplar Springs Stream Restoration
Burke, VA

Before **After**

Completed Projects

Completed Projects

Completed Projects

Completed Projects

Completed Projects

Competed Project: Bridle Path

Before Construction: Severe Streambank Erosion along Property Lines

Competed Project: Bridle Path

Post Construction

Competed Project: Bridle Path

Post Construction

McLean Community Center

Before

After

Big Rocky Run Tributary- Centreville

Big Rocky Run Tributary- Centreville

Big Rocky Run Tributary- Centreville

Big Rocky Run Tributary- Centreville

Big Rocky Run Tributary- Centreville

Next Steps

Project Schedule

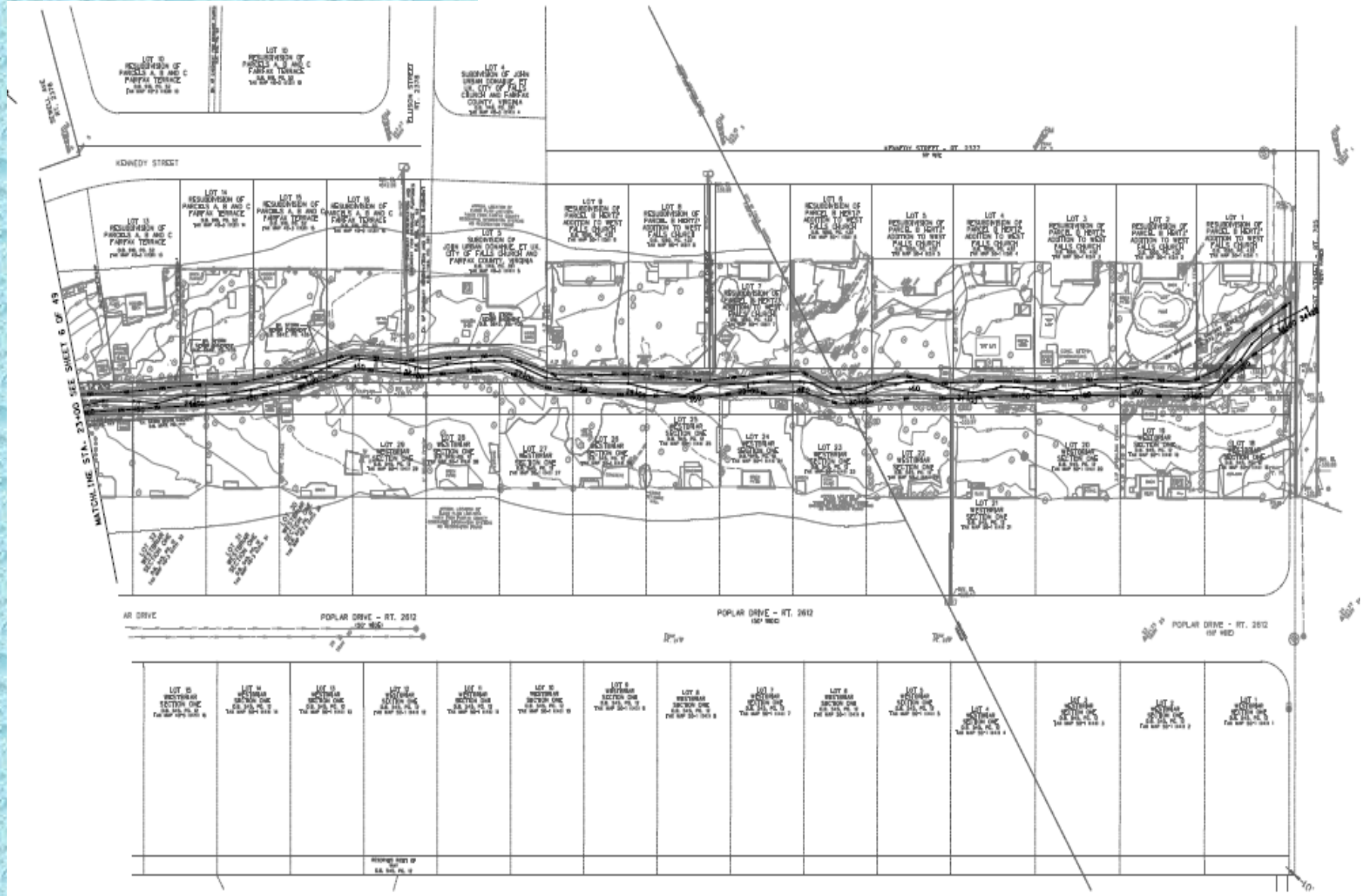
- **Phase I**
  - 100% Design Complete 6/2011
  - Public Bid/Construction Contract 6/2011-8/2011
  - Construction Start 9/2011 (After PHRA Season)
  - Construction Completion 1/2012
- **Phase II**
  - To Be Determined
  - Stakeholder participation and funding availability

Contact Information

Justin Pistore – Project Manager
703-324-5685
justin.pistore@fairfaxcounty.gov

Fairfax County Stormwater Planning Division
703-324-5500 TTY 711
12000 Government Center Parkway
Suite 449
Fairfax, Virginia 22035
www.fairfaxcounty.gov/dpwes/stormwater

To request this information in an alternate format
call 703-324-5500, TTY 711



Fairfax County Stormwater Management